Multiple Ileum Perforation Resulting from Blunt Abdominal Trauma: A Case Report

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ABSTRACT

Background: Ileum perforation resulting from blunt trauma is rare condition. Early recognition of small bowel injury is important in order to prevent morbidity, because delay in diagnosis may lead to several complication such as abscess, sepsis, and mortality due to delayed in surgical repair.

Case description: A 31 years old male has multiple ileum perforation after blunt trauma resulting from motorcycle accident. The sign and symptoms apparent peritonitis occurred more than 6 hours of observation. Explorative laparotomy was performed and showed multiple ileum perforation and mesenterial tears. Resection of ileum was done with 5 cms length and ileoileal anastomose was performed. Patient recovered well and no complication noted. Patient was discharged after 11 days of hospitalization.

Conclusion: The clinically apparent peritonitis from small bowel perforation may develop slowly so the careful examination and observation is required in patient with abdominal blunt trauma. Early recognition is important in order to prevent morbidity, complication, and mortality.

Keywords: Blunt trauma, abdominal trauma, ileum perforation, small bowel

1. Introduction

The abdomen is one of the most common part that injured in trauma patients and remain the leading cause of morbidity and mortality in all age group. [1, 2] Abdominal trauma is categorized by mechanism of injury blunt and penetrating trauma. [3] Blunt abdominal trauma causing ileum perforation is rare condition because high velocity impact was necessary to cause hollow organ perforation. [4]

Despite advance in diagnostic procedure, diagnosis and management of ileum perforation still challenging because of characteristic of small bowel perforation is usually small size so the signs of peritonitis may be slow to develop. They also seldom produce free air on abdominal plain x-ray and can be overlooked during abdominal exploration if it is not examined carefully. [5]

Below we describe a case of patient with multiple ileum perforation and mesenterial laceration resulting from abdominal blunt trauma.

2. Case Description

A 31 years old male was referred to our emergency department from public health service. He involved in a head-on motor vehicle collision but he did not remember the accident well. He was complaining pain in his right elbow and left leg and no other dominant complain. The Glasgow coma scale was 15 and his vital signs were as follows: respiratory rate, 24 breaths per minute; oxygen saturation on room air, 99%; systolic blood pressure, 128/87 mmHg; pulse rate, 110 beats per minute; and body temperature, 36.9 °C. The lungs were clear, and the heart was normal. Initially, the abdomen was soepel, no penetrating injury in the abdomen, there just a minimal excoriation in the abdomen, but had minimal discomfort with palpation diffusely. There was no rebound tenderness, no muscular defans, no mass was found and the bowel sounds were normal. The next evaluation was performed and the patient developed abdominal pain and abdominal muscular defans was existed. Abdominal plain x-ray was performed but no free air was found.

Laboratory test findings (normal ranges in parentheses) on hospital day 1 were as follows: white blood cells, $11.08 \times 10^3/\mu L$ ($3.8–10.6 \times 10^3/\mu L$); serum hemoglobin, 16.5 mg/dL (13.2–17.3 mg/dL); platelets,

341 × 10^3/μL (150–440 × 10^3/μL); activated partial thromboplastin time, 32.5 s (24.5–32.8 s); prothrombin time, 11.4 s (9.3–11.4 s); ureum 23.54 mg/dl (10-50), creatinine serum 0.85 mg/dl (0.9-1.3), AST 76 U/L (<37), ALT 57 (<42), HbsAg was negative.

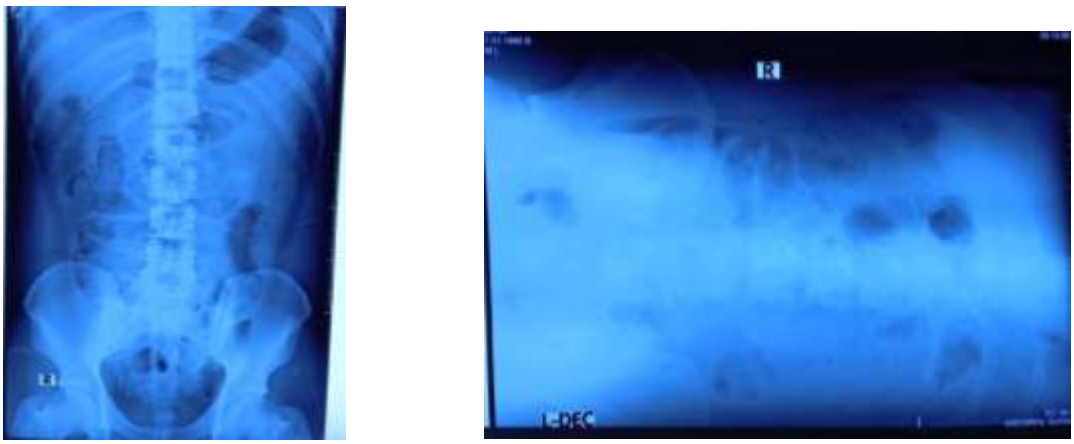

Figure 1. (Left) Plain abdominal x-ray ; (Right) Left lateral decubitus position
No free air was seen

The patient was taken to the operating room with a presumed diagnosis of visceral perforation. The laparotomy showed multiple ileum perforation 150 cms and 190 cms from the ligament of Treitz and mesenterial tear. Resection of ileum was done with 5 cms length and ileoileal anastomose was performed. His post operative recovery was good and no complication happened. He was discharged after 11 days hospitalization.

Figure 2. Ileum perforation and mesenteric tears

3. Discussion

Hollow organ perforation resulting from blunt trauma is rarely happened. [4] The incidence was 1-3 % with small bowel injury happened in the most cases.[6] The primary mechanism of small bowel perforation resulting from blunt trauma are compression and deceleration forced. Direct compression of the organ between

two opposing surface abdominal wall and vertebral column may result direct deformity or transient increasing intraluminal pressure that cause rupture of the hollow organ. Sudden deceleration forces may cause stretching and linear shearing between relatively fixed and free object (intestine that fixed by mesenterial) resulting thrombosis, mesenteric tears, and splanchnic vessel injury. The preexisting adhesion from previous surgery or other pathologic condition may predisposed other mechanism [6-8]

Early recognition of small bowel injury is important in order to prevent morbidity but it is still become a challenge. [6] The diagnosis of intestinal perforation after blunt trauma often delayed. The perforation is usually small ranging from 4 mm to 2 cm that make signs of peritonitis may be slow to develop. Several cases involving minor and isolated injury may left subclinical and undiagnosed until complication happened. From abdominal x-ray examination, small bowel perforation seldom produces free air that make diagnosis difficult. They also may be overlooked during abdomen exploration if it is not examined carefully. [5, 9] Plain radiograph has sensitivity less than 50% for intraperitoneal free air. Experimental studies have demonstrated that plain radiograph can detect 1 to 2 mL of injected air in the peritoneum under optimal positioning and technique but under trauma circumstance it is not possible to make optimal positioning. In many centers diagnostic peritoneal lavage (DPL) remains the standard for the evaluation of blunt abdominal injury. But recently the use of DPL often replaced by abdominal computed tomography (CT) with similar sensitivity when performed by experienced trauma radiologists. [7, 8, 10] Ultrasound also can be used to evaluate patient with blunt abdominal trauma that less invasive with positive result may show evidence of free fluid or solid organ injury. [7]

Management of small bowel perforation patient consist of initial and definitive treatment. Initial treatment that important for all patient includes bowel rest, intravenous fluids, intravenous broad-spectrum antibiotics, and regular abdominal examinations. Laparotomy is intervention of choice with resection or repair of the perforated site with or without drainage and diversion. Simple closure is usually adequate for simple perforation of the small intestine, but extensive injuries need resection and anastomosis. [7, 11]

Complications that develop from an intestinal perforation can be related to the disease or the treatments. Complication may develop when small bowel perforation left untreated. Perforation and leakage of intestinal contents can progress to peritonitis, abdominal abscess, or intestinal fistula. Intestinal stenosis may also happen as a rare sequel of undiagnosed blunt abdominal trauma. [8, 12] Potential complications of surgery such risks of infection, bleeding, potential anastomotic leakage, and hernia formation must be discussed with patients and their family. Other complication risk of pulmonary complications, thromboembolic events, cardiovascular events, and possible prolonged ICU stay that may be need for ventilator support must also be discussed. The recovery process and level of function after recovery also need to be told. [11]

The mortality and morbidity of small bowel perforation is corelated to the delay in diagnosis allowing delay in surgical intervention. The mortality of isolated intestinal perforation is low when it can be detected and managed early. According to a study, the prognosis was poor when the interval between injury and surgery was greater than 12 hours. [5] When surgical repair is delayed more than 24 hours, mortality is usually related to intraperitoneal sepsis. [8] The mortality also increase as number of associated injury increase. [7]

4. Conclusion

The clinically apparent peritonitis from ileum perforation may develop slowly so the careful examination and observation is required in patient with abdominal blunt trauma. Early recognition and prompt treatment is important in order to prevent morbidity, complication, and mortality.

Acknowledgements

The authors would like to thank to the patient and his caregivers who allowed this case to be documented.

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